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## Art. I.—CLINICAL LECTURE ON A NEW MODE OF TREATING HYPERTROPHY OF THE HEART.

BY DR. A. T. THOMPSON.

(Delivered at University College Hospital.)[1]

*Hypertrophy of the heart—Symptoms indicative of the disease—Utility of milk diet—Difference between the impulse of the heart in hypertrophy and nervous palpitation—Danger of frequent large blood-lettings in hypertrophy—New mode of treating cardiac hypertrophy by elaterium and alcohol—The mode of action of these agents.*

The subject of the case, Wm. Gardner, aged 40, was admitted on the 1st of September. He is a cowkeeper, a married man, of temperate habits, and had been in the hospital twice before for the same complaint. The symptoms under which he laboured, on his admission, were ascites, with considerable œdema of the legs, attended with great weakness of the knees and ankles, which prevented him from walking even the length of the ward. He suffered also under dyspnœa, which amounted almost to suffocation, when he attempted to lie down, with pain of the chest, cough, and expectoration of muco-purulent sputa. The other symptoms were anorexia; constipation; the urine scanty, turbid, and high-coloured; the pulse sharp and quick, and the skin hot and dry.

The physical signs and sounds on percussion and auscultation were, dulness over the region of the heart, and extending beyond it; the impulse of the heart considerable, with a rasping sound, as well as a double bellows sound, loudest over the aortic valves, and at the base of the organ; the respiratory murmur, superiorly, was puerile, with some sonorous râle; and a slight degree of crepitation, inferiorly, both before and behind. He was ordered one grain of elaterium, with twelve grains of the crumbs of bread, to be made into four pills, one of which was to be taken every six hours. He was placed on low diet. This medicine was continued until the 10th, with evident advantage. He was copiously purged, but not weakened; he walked better; the ascites and œdema had disappeared; there was scarcely a trace of crepitant râle inferiorly; and the heart's impulse was greatly lessened. The strength of the pulse, however, still continued. The pills were ordered to be discontinued, and in their stead the following drops were prescribed:—Elaterium, one grain; alcohol, two drams; dissolve. Eight minims to be taken in a wineglassful of water, three times daily. He was placed upon milk diet.

On the 17th, having caught cold, he complained that the drops occasioned pain in the abdomen, without purging. His pulse was sharper and quicker than before, and his cough increased in hardness and frequency. Twelve

[1] Lancet, Nov. 24, 1838, p. 320.

ounces of blood were taken from the arm. The drops were continued, with fifteen minims of tincture of henbane added to each dose, and the following pills were ordered to be taken at bed-time occasionally :—One grain of calomel, and three grains of the extract of hyoscyamus. He continued this medicine with the most decided advantage; the impulse of the heart diminished, as well as the rasping sound, and he could ascend the hospital stairs without suffering either from dyspnœa or palpitation. He, however, again caught cold on the 26th of October, when he was again bled, and took a pill, containing three grains of calomel, and one of opium afterwards. When his bowels had been freely opened, he returned to the use of the drops.

He was discharged apparently well on the 5th of November.

In his clinical lecture, Dr. Thompson remarked :—This is a case of hypertrophy of the left ventricle of the heart, accompanied by the deposition of osseous matter on the valves, as indicated by the *rasping* or *sawing* sound which accompanies the impulse of the heart, and the pain which existed in the region of the heart when the patient was admitted at both times into the hospital. With regard to the last of these symptoms, it is proper to caution you, gentlemen, against adopting an opinion that pain referred to the heart is always indicative, in hypertrophy, of some degree of inflammation of the lining membrane of that organ. On the contrary, it is most frequently owing to the simple defect of the elasticity of the ossified parts preventing them from yielding simultaneously with the other portions of the diseased organ, whilst labouring under palpitation. From such a condition of the heart and the aortic valves, the *dyspnœa* consequent on any exertion, or even lying flat in bed, can be readily explained; there is a transitory pulmonary congestion, which prevents the decarbonisation of the blood, and, consequently, causes a sensation of suffocation, which ceases when the labouring action of the heart is lessened by a cessation of the exertion which excited it, or when a change from the recumbent to the erect position is effected. Cardiac dyspnœa, also, may be excited by derangement of the digestive organs, or by the introduction into the stomach of any thing which can morbidly irritate it, as this condition of the organ is propagated to the heart, and augments its already inordinate action. It is on this account that the dyspnœa, attendant especially on hypertrophy of the left ventricle, often supervenes on a meal, or any circumstance which can produce acidity or flatulence; and is often accompanied, as in our case, with a sensation of weight over the forehead and throbbing of the temples. Nothing is more important, therefore, than the regulation of the diet in such cases; and experience has convinced me that milk is preferable to every other description of food, as it is less stimulant than any other animal diet, and less apt to run into the acetous fermentation than vegetable matter. It may be objected that milk is too nutritive in a disease, the result of increased nutrition in the affected organ; but the general nutrition may be regulated by the quantity allowed; and I suspect that the danger in hypertrophy, arising from improper diet, depends more on its stimulant property than on its nutritive quality.

In every case of hypertrophy the capillary congestion, which is the result of the augmented impetus and activity of the arterial circulation, gives rise to dropsy; consequently, as in this case, and in many others, which have appeared in the hospital, when they have been admitted in an advanced stage of the disease, both ascites and anasarca have been present; indeed, these are the symptoms which usually most forcibly attract the attention of the patients, and induce them to apply for relief. This engorgement of the capillaries, and its consequences, depend upon two causes, viz. the impediment of the return of the venous blood to the heart, and the increased energy which that organ, in its hypertrophied state, imparts to the arterial circulation.

Whatever, therefore, diminishes the circulating mass must relieve this

condition of the capillaries; and, in preventing further exhalation of their serous contents, must give time to the absorbents to remove that fluid which is already deposited, and thus relieve the dropsy. Blood-letting most rapidly fulfils this indication; but there are objections to its frequent repetition, which I shall point out in proposing the theory of the successful practice which has been followed in this case, and in other cases which have been treated by me, both in the hospital and in private practice. In no disease do we so much depend on the stethoscope as in hypertrophy of the heart. I am, therefore, most anxious that you should examine, attentively and frequently, the signs which it affords. It is impossible to communicate, in words, the information which is thus to be acquired, you must obtain it for yourselves by frequent and attentive observations. I may inform you that a strong heaving *impulse*, followed by a decidedly evident *back stroke*, occurred in our case, and indicated simple hypertrophy, while the *sawing sound* denoted an unequal or ragged deposition of osseous matter on the valves; but, without endeavouring to detect these sounds yourselves, by aural examination, my information extends not beyond the expression of the words in which it is attempted to be conveyed. It may, however, be useful to mention to you a distinction between the impulse of the heart in real hypertrophy, and that in palpitation of a transitory kind, depending on nervous susceptibility. In real hypertrophy, even without dilatation, the impulse is that which we may suppose to be caused by the whole length of the ventricle striking against the parietes of the chest, so as to produce a kind of heaving blow, while in nervous palpitation the impulse is rather a jerk, sharp and circumscribed, as if arising rather from the apex of the organ than from its side. If we reflect upon the relief afforded in this case, and that of several others which have left this hospital in a condition equally favourable, a question arises, what would have been the termination of these cases if the successful treatment which has relieved them had not been adopted? The reply is, that much depends on the character of the case, and whether it is merely simple hypertrophy, or is complicated, as in Gardner's case, with disease of the valves. In this case it is probable that the aortic valves are those most diseased, consequently they present an obstacle to the ventricle emptying its contents, and the right ventricle acting in concert with it, the lungs become overloaded with blood, whence dyspnœa and engorgement of the left ventricle, which, labouring to relieve itself, the hypertrophy proceeds to a greater extent, and the disease might terminate in apoplexy, or in fatal hæmoptysis. The prognosis, therefore, in this case would have been unfavourable; and even now, unless the habits of the patient, in respect to diet, exertion, and temperance, shall remain extremely guarded, it must still be unfavourable. I shall now endeavour to explain to you the principles of the treatment which I adopted in this case.

It is generally admitted that hypertrophy is the result of increased nutrition; but it is requisite to draw a line between the morbid augmentation of bulk thus produced in an organ, and that which is the result of inflammation. Assimilation consists in the attraction which exists between the alimentary particles and similar particles in the blood, and the infusion, if I may so speak, of the vital principle into the newly assimilated matter. In inflammation, on the other hand, the albumen and the fibrine of the blood are deposited in the interstitial tissue, but without being assimilated, or sharing in the vital energy of the organ. The growth of an organ, therefore, is affected by an augmented afflux of blood to it, as well as by the attraction and assimilation of the fluid parts of the blood; and, when the organ is a moving or a moveable one, this process is favoured by motion or exercise determining a greater supply of blood to the part. Under such circumstances it becomes obvious that, in order to check this augmentation of bulk, two distinct objects must be kept in view, viz. first, to lessen the action in the part; secondly, to diminish the supply of nutritive matter sent

to it. In the case which is now before us, and in many others, the exciting cause of the inordinate action set up in the heart appears to have been metatasis of rheumatic inflammation; but although this was subdued, yet the action which had been commenced by it continued; increased nutrition and augmented bulk of the parietes of the left ventricle were superinduced. There was in this instance no reason to suppose, either from the physical signs or from the state of the pulse, that, although the valves were diseased, any, or at least *much* dilatation accompanied the hypertrophied condition of the heart; on the contrary, the strong, tense, cord-like, unexpanding beat of the pulse indicated the probability of contraction. Now, not only in such a condition of the heart, but also where dilatation is present, and even disease of the valves, the first object of our treatment is to diminish action; and to accomplish this, blood-letting has been resorted to with a freedom, as to the quantity abstracted, and a frequency of repetition, which, however salutary it may be in the commencement of the disease, is undoubtedly hazardous when it has proceeded so far as to produce ascites and œdema, with evident general cachexy. I am perfectly aware that this opinion is opposed to that of Laennec, Albertini, Valsalva, and some other distinguished practitioners, but my own experience has decided me against large and repeated bleedings, which, although they afford transitory relief, yet have produced no permanent benefit. On the contrary, notwithstanding the powers of the vascular system are diminished, the paroxysms have recurred more frequently and with greater violence than when no bleeding has been resorted to; and when the disease has advanced so far as to produce anasarca, large bleedings have appeared to me to hurry on the fatal termination. Were I to reason upon this effect of large and repeated bleedings, I should be disposed to attribute it to the deteriorated state of the vital fluid, and consequently its unsuitableness for the due nutrition and upholding of the general system. In as far as respects this case, which is complicated with disease of the valves, blood-letting, as it cannot cure the ossified valves, and diminishes the patient's strength, is still more objectionable than in simple hypertrophy. When the abstraction of blood is large and frequently repeated, it rather embarrasses than relieves the valvular obstruction. This opinion, however, must not be supposed to apply to small topical bleedings, either by cupping or by means of leeches.

These effects of blood-letting and the frequent inefficiency of diuretics, and of common saline purgatives, to reduce the mass of the circulating fluid without materially deteriorating the quality of the blood, induced me to have recourse to elaterium, which, by its operation on the intestinal exhalants, producing copious watery stools, is well adapted to carry off a large portion of the serum of the blood without diminishing the fibrine and the red globules, which are the parts essential to maintain the powers of the habit. It is, probably, on this account that the rallying of the powers of the system, after the action of elaterium, is so remarkably displayed. It may be affirmed that diuretics operate in the same manner, namely, by drawing off the watery part of the blood; but diuretics are variable and less certain in their effects than purgatives, which operate chiefly upon the intestinal exhalants; and, assuredly, the most efficient and the least exhausting of these is elaterium, when it is properly administered. Another advantage attached to elaterium and calomel is, that no remedial means are so likely to prove serviceable in the advanced stage of the disease, in preventing further dropsical effusions, and enabling the absorbents to remove the fluids already deposited. The circulation is, by the influence of the elaterium, unburthened; and consequently the removal of even the mechanical obstructions to the free action of the heart, lessens the struggles of that organ to overcome them, and with these the morbid activity of the coronary arteries, on which the augmented nutrition of the heart chiefly depends, being also diminished, both the action and the augmentation of the bulk of the organ

are kept under control. It has been said that elaterium affects different individuals very differently: this is true, consequently the dose should be very minute at first and very gradually augmented. It is well known that calomel does not increase the purgative action of elaterium, while it tends to allay its griping property; and this is still more allayed by the addition of a grain or two of capsicum. It is an important fact that the purgative influence of the elaterium does not lessen the excitant power of the calomel over the capillary vessels; indeed, the system is more rapidly brought under the mercurial action than it is when no elaterium is administered. The elaterium, by unloading the circulation, gives a spring and an activity to the lymphatics which aids the introduction of the mercury into the system.

With respect to the second object in the treatment of hypertrophy, namely, the diminution of the supply of nutritive matter,—the most direct mode of fulfilling this indication is, undoubtedly, to reduce the quantity of aliment; but this is often difficult to accomplish on account of the morbid appetite which sometimes accompanies the disease. In prescribing the acetate of lead, in some of the cases which have been in the hospital, for this purpose, my intention was to act upon the nervous system in such a manner as to diminish the nutritive and assimilating processes, and, by lessening the influence of these, to diminish their effects upon the heart. I had seen the powerful influence of the salts of lead in fulfilling this intention in cases of poisoning by them; but the difficulty of obviating the deleterious influences of the salts of lead, where they display themselves, prevents me from always recommending them for this purpose. When the use of the acetate of lead has been continued for some time, its sedative powers operating upon the stomach, tend to convert it into the carbonate, in which form it rapidly induces symptoms of colica pictonum, and consequently must be discontinued. Elaterium, given in the alcoholic solution, fortunately renders the administration of the acetate of lead or any other sedative unnecessary, as it not only keeps up a due influence upon the intestinal canal, but it keeps down the appetite, without inducing a dyspeptic condition of that organ, which is always to be dreaded. When the stomach becomes loaded with acid, and flatulence is troublesome, I have never seen any disadvantage arise from clearing it by means of half a dram of ipecacuanha, after which the nervous system may be tranquillised by a full dose of tincture of henbane. Some of you must have witnessed both the safety and the advantage of this practice in Gardner's case. If the diet be chiefly milk, I have never seen any indication for the administration of tonics, unless it be in the use of the shower-bath in a tepid state.

Upon the whole the treatment in hypertrophy is to diminish the force of the moving powers, and the mass of the circulating fluids, without breaking down the powers of the system. We know that in all diseases in which the circulating fluids suffer a change, nutrition also suffers. This is especially demonstrated in several diseases, in syphilis, for example, in scrofula, in scorbutus, and in many other similar affections. In these the nutritive power is diminished not in one, but in all the organs. This is a state, however, the opposite of that which occurs in hypertrophy, in which, if the general system suffers, the organ peculiarly affected—namely, the hypertrophied heart—instead of sympathising with the general condition of the system, is usually rendered more energetic in its action.

In concluding these remarks on hypertrophy I have only to repeat the result of my experience, and my firm conviction that the most efficient method of unloading the circulation, as well as lessening the nutritive and assimilating process, is by taking advantage of elaterium. It becomes a curious and important object of enquiry, whether the heart, in a state of hypertrophy, when its momentum is diminished and it remains quiet, regains its natural dimensions? If we may be permitted to reason from analogy, there is much probability that this is the case. Thus we find, that in consequence of diseased states of the blood, when nutrition is less active,

the muscles waste: this is daily observed in paralysis of the arms and the lower limbs; and there is no reason which should prevent the same effect from following the check to the influence of the nutritive function which elaterium or any other medicinal agent may cause in hypertrophy of the heart, when they prove successful.

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## Art. II.—PHILADELPHIA HOSPITAL (BLOCKLEY).

DR. DUNGLISON, ATTENDING PHYSICIAN.

1.—*Case of Mania à Potu, successfully treated by Expectation.* Reported by Dr. A. M. Vedder, Senior Resident Physician.

Catharine S., æt. 48, the mother of ten children, was admitted on the 11th of October with well-developed mania à potu. Her friends state, that she has been a confirmed drunkard for twelve or fifteen years. For the two weeks previous to her admission, she had drunk from one to two quarts of common gin daily; during this time eating scarcely any thing. On the night of the 7th she became delirious, and called in the watchman, stating that the marines were in her house attempting to shoot her. For the last *five* nights she has slept none; was wandering about the streets day and night, drinking all she could get, until the period of her admission. This is worthy of notice, since it shows that the disease may be produced without the withdrawal of stimulus. At her admission she was very loquacious, jocose, motions quick, and pupils not contracted; tremors; pulse 84. Several bruises on her person caused by falling in a cellar. Menstruation. Illusions of all the perceptive faculties; sees her own coffin; children fancifully dressed dancing along the wall. She was kept in a small room, and committed to the vis medicatrix naturæ. In the evening there was an increase of all her symptoms.

The manipulations of animal magnetism were tried for a short time; some peculiar phenomena were produced; the sleep, however, was imperfect and transient. Insomnia continued until the latter part of the night, when she slept for three hours.

On the following morning she was more quiet; less loquacious; pupils decidedly dilated; pulse 60, intermitting. No treatment.

The following two nights she slept none, and in the evening of the 13th she was more violent; pupils smaller. Was fastened to her bed, which had the effect of quieting her. Appetite as in health. No abatement of hallucinations.

On the 14th, she was permitted to walk about the hall, which was evidently beneficial; but, as night approached, all the symptoms became aggravated; the illusions were frightful; she vociferated when left alone. In the latter part of the night she slept five hours, and was quieted by the company of another person. In the morning (15th) the illusions had ceased, but her mind was not clear; permitted to walk about. As evening approached, her former symptoms again returned, but she slept seven hours; after waking, her mind was perfectly clear, and the cure was perfect.

Discharged on the 17th September.

The delirium, in this case, persisted for nine days. The insomnia was equally protracted; she had only three hours' sleep in seven nights. It was thought to be a fair case to test the practice by expectation, and the result was satisfactory. The same method has been used in other cases with equal success; no case having terminated fatally. These cases prove that the recuperative powers of the system are sufficient to overcome the disease, but it remains to be proved whether it is the best practice. The numerical method of Louis can only settle this question. From the report of one of

the eastern hospitals it would seem, that the treatment by expectation is more successful than any hitherto employed.

During the whole course of this case the strength of the patient was probably as great as in health. The character of the illusions was for the most part pleasing, and at times amusing. At one time she was grasping at some imaginary object, and then conducted her hands to her mouth, as if eating something, as she commenced chewing. She said she was eating bread and cheese.

2.—*Case of Mania à Potu* (*2d stage*), *showing the effect of Animal Magnetism as a Therapeutic Agent.* Reported by Dr. A. M. Vedder, Senior Resident Physician.

Ellen D., æt. 22, an intelligent unmarried female, entered the hospital with mania à potu, advanced to the second stage. Had a similar attack in 1831. Has been addicted to drinking for about sixteen years. For the last two weeks she has been drinking about a pint of brandy daily; some days a quart. She ceased drinking only twenty-four hours before her admission, thinking it might increase a dysentery which attacked her a few days before. Has slept none for two nights past. Was not in the house when former experiments on animal magnetism were made.

At her admission, Oct 5th, P. M., she was in the following condition:—Face rather high coloured and swollen; pupils natural; respiration frequent; abdomen very tender on pressure; complains of dizziness, heaviness, and cephalalgia; sighs now and then; tinnitus aurium; starts suddenly, thinking she has seen a large man; coldness of the feet: thinks she will certainly die; no tremors; pulse 96.

Applicentur cucurbitulæ cum ferro, No. IV. nuchæ, et sinapismata regioni umbilici.

She was ordered half an ounce of brandy every two hours, and, in the intermediate hours, the following powder:—

R. P. ipecac. c. gr. x.; p. opii, gr. ss.

On the next morning she was as follows:—Six of the powders were taken during the night; vomited frequently; slept none; evacuations were frequent, containing mucus, no blood; tenesmus; no tormina. She saw frogs, snakes, etc. on the wall. Respiration 42; complains of the same uneasy sensations, but thinks they were diminished after the cupping; changes her position frequently. The acetate of morphia was directed to be sprinkled on the blistered surface, an epispastic having been applied to the epigastrium in the morning. The cupping was repeated, and the opiate diminished one half. An enema was given, containing ʒss of Tr. opii. The brandy was continued; the vomiting persisted during the day; stools much diminished in frequency. All treatment was suspended, and small quantities of iced water were administered.

She slept none during the night of the sixth;—a grain and a half of morphia was given in divided doses. The illusions continued.

On the morning of the 7th she was more composed; respiration less frequent; pulse 72; vomiting almost ceased; two stools in twenty-four hours; no blood nor mucus. Cupping to be repeated.

We now come to the remarkable features of the case. I remarked to my colleague, Dr. Taylor—not in the presence of the patient—that this would be a fair case to test animal magnetism as a therapeutical agent. The patient had slept none for four successive nights, and had taken in all an equivalent of eighteen grains of opium since her admission; but none for the last sixteen hours. The usual manipulations were accordingly practised in the presence of Dr. T. and the keeper. The patient was as wakeful as at any time previous. Her thumbs were grasped (she was lying in bed), and a few passes were subsequently made; in *three minutes*, to our surprise, she was in a sound sleep, as evinced by snoring and diminished frequency

of respiration, which were carefully noted. She could be aroused when spoken to in a loud tone,—starting suddenly, but instantly falling asleep again. She slept until 12½ o'clock, A. M.—four and a half hours—and awoke spontaneously. At 10½ o'clock, her hand was placed near her forehead, but not so as to touch it; and it remained in this constrained position precisely, until she awoke. She complained of this hand feeling "numb and dead." She was asked if she had slept; replied she had, but could not say how long, or when she fell asleep. She remarked that she felt "refreshed and like another woman." Sleep was again produced, after holding her thumbs for one minute and three quarters, and she slept for three hours and a half. Sensibility was not lost, but it was imperfect. No voluntary effort on her own part could keep her awake. Her pulse, while awake, was eighty-four, and soon fell to sixty when asleep. The number of inspirations suffered a corresponding diminution, but they were fuller. After the second nap she felt "giddy and bad." But the most remarkable phenomenon we have but partially adverted to. Her limbs, when placed in any position, remained so. Her inferior extremities were raised from the bed at an angle of about 30° with the bed, in which position they remained for ten minutes, at the same time supporting the weight of the bed-clothes: they would have remained so longer, but it was not thought prudent to continue them in this constrained position. The same peculiarity was exhibited by all the other voluntary muscles. The illusions entirely ceased after the artificial sleep, if we may so call it. The patient remained in the ward until the 15th, on account of her dysentery, and was then discharged.

We afterwards discovered that it was not necessary to touch her person to produce sleep, and that it could be done in less than a minute by simply looking at her. She was put asleep by several of the resident physicians who were witness to many of the above experiments. Similar attempts were made with two female patients labouring under the same disease, but our success was very imperfect.

We might add several curious points in addition to those stated, but defer them at present. A. M. VEDDER.

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## BIBLIOGRAPHICAL NOTICES.

### *Evers's Comparative Anatomy.*[1]

This work, as its title imports, is but an epitome, yet it contains a succinct account of the results of the labours of modern authors on this interesting topic. It will not occupy more than a number of the "Library," and it is probable that we may reprint it in the present volume, unless some recent practical essay of appropriate character and dimensions should previously reach us.

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The three following articles are from the proceedings of the Royal Society, in the Lond. and Edinb. Philos. Magazine, for December, 1838.

*On the Structure of the Teeth, the vascularity of those organs, and their relation to bone.* By JOHN TOMES, ESQ.—The microscopical examinations which the author has made of the structure of the teeth of man and various animals, leads him to the conclusion that their bony portions are formed of minute tubes, disposed in a radiated arrangement, in lines proceeding every where perpendicularly from the inner surface of the cavity containing the

[1] The Student's Compendium of Comparative Anatomy. By P. Evers, Licentiate of the Royal College of Surgeons in Ireland, &c. &c. 8vo, pp. 165. Dublin, 1839.

pulp. These tubuli are surrounded by a transparent material, which cements them together into a solid and dense mass. He finds, by applying the test of muriatic acid, that carbonate as well as phosphate of lime enters into their composition. In man, the tubuli, during their divergence from their origin at the surface of the central cavity, send off a number of very minute fibrils; and on approaching the enamel or the granular substance, which cover respectively the crown and the fangs of the tooth, the tubuli divide into smaller ones, which freely anastomose with one another, and then either are continued into the enamel, or terminate at the boundary between these two substances. Various modifications of this structure, exhibited in the teeth of different animals, in the class of the mammalia and fishes more particularly, are minutely described. The granular substance appears to be composed of irregularly shaped osseous granules, imbedded in the same kind of transparent medium which cements the tubuli together. External to the granular portion, the author finds another substance entering into the formation of the simple tooth, and commencing where the enamel terminates; and which he describes as beginning by a thin and transparent layer containing only a few dark fibres, which pass directly outwards; but assuming, as it proceeds towards the apex of the fang, greater thickness and opacity, and being traversed by vessels.

External to the enamel, and in close connection with it, in compound teeth, is situated the crusta petrosa, a substance very similar to the bony layer of the simple tooth. It contains numerous corpuscles, and is traversed by numerous vessels entering into it from without, and anastomosing freely with one another, but terminating in its substance. These investigations of the structure of the different component parts of teeth, furnish abundant evidence of their vascularity and consequent vitality.

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*On the evolution of Nitrogen during the growth of Plants, and the sources from whence they derive that element.* By Robert Rigg, Esq.—In this communication the author follows up his inquiry into the influence and importance of nitrogen in vegetable physiology, by noticing, in the first place, the experiments of Dr. Daubeny, M. De Saussure, Sir Humphry Davy, and those which he himself has made; all of which tend to prove that nitrogen is evolved during the healthy performance of the functions of plants; that the proportion which it bears to the oxygen given off is influenced by the sun's rays; but that owing to the necessary exclusion of the external atmosphere during the progress of the experiments, it is impossible, with any degree of accuracy, to calculate the volume of these evolved gases during any period of the growth of plants in their natural state.

If to this indefinite quantity of nitrogen given off by plants there be added that definite volume incorporated into their substance and shown in the author's former tables, the question arises, whence do plants derive their nitrogen, and does any part of it proceed from the atmosphere? A problem which the author proposes to solve by a series of tabulated experiments upon seeds, and seedling plants, indicating a large excess of nitrogen in the latter, and under such circumstances of growth that he is compelled to fix upon the atmosphere as its source.

By the same mode of experimenting, the author attempts to show that the differences which we find in the germination of seeds and the growth of plants in the shade and sunshine, are apparently due in a great measure to the influence of nitrogen. And he concludes by observing that he does not touch upon the practical application of the subject wherein the real value of the inquiry consists; it is his object to draw attention to an element which, though in some instances so minute in quantity as to be with difficulty detected in our balances, has nevertheless been wisely assigned to discharge the most important functions.

*On the Decussation of Fibres at the Junction of the Medulla Spinalis with the Medulla Oblongata.* By JOHN HILTON, Esq.—The author first alludes to what usually happens in affections of the brain, namely, that the loss of voluntary power and of sensation manifest themselves in the opposite side of the body to that in which the cerebral lesion exists, a fact which has been attempted to be explained by the crossing of the fibres at the junction of the *medulla oblongata* with the anterior or motor columns of the *medulla spinalis;* but such a structure, he observes, affords no explanation of the loss of sensation. The author, then, referring to the communication of Sir Charles Bell to the Royal Society, in the year 1835,[1] describing a decussation connected with the posterior columns, or columns of sensation, mentions that the accuracy of these dissections was doubted by Mr. Mayo and other eminent anatomists. The author proceeds to state that the symptoms of cerebral lesion do not always take place on the opposite side of the body to that in which the lesion of the brain exists, but that they occur sometimes on the same side; that the loss of power and of sensation, although confined to the same side, may exist in either the upper or the lower extremity; but that both are not necessarily implicated; and that, in fact, cases occur where there are marked deviations from what may be considered the more common occurrence. Having observed such cases, and not being aware of any satisfactory explanation, the author examined with care the continuation upwards of the anterior and posterior columns of the spinal marrow into the *medulla oblongata*, and found that the decussation at the upper part of the spinal marrow belonged in part to the columns for motion, and in part to the columns for sensation; and farther, that the decussation is only partial with respect to either of these columns; thus elucidating by the observation of the actual structure what before appeared very unsatisfactory in pathology, and anomalous in disease.

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*Researches in Embryology. First Series.* By MARTIN BARRY, M. D., F. R. S. E., Fellow of the Royal College of Physicians in Edinburgh.—This paper is divided into two parts. In the first part the author describes the origin and structure of the ovisac, a vesicle common to all vertebrated animals, but hitherto regarded as the inner membrane of the "folliculus Graafianus" in mammalia, and by some authors denominated the "chorion" in other vertebrata. He also describes the real nature of the "folliculus Graafianus," and its relation to the calyx of the bird; the germinal vesicle and its contents, as being the most primitive portion of the ovum; the order of formation of the several other parts of the ovarian ovum: and the true chorion of mammalia as being a structure superadded within the ovary.

In the second part the author describes a granulous tunic of the ovum of mammalia not hitherto observed: the manner of origin of the "membrana granulosa of authors; the different situations of the ovum in the graafian vesicle at certain periods *ante coitum*, not hitherto observed; and certain structures by means of which the ovum is made to occupy these several situations.

The following are the principal facts made known by Dr. Barry in this memoir; but other facts are also mentioned, which he intends to make the subject of a future communication. In mammalia and in birds, the germinal vesicle and its contents are those parts of the ovum which are first formed. The germinal vesicle at an early period is surrounded by peculiar granules, forming an envelope not hitherto described. The ovum of all vertebrated animals is contained in a vesicle (the "chorion" of some authors, found in birds, amphibia, and fishes), which is essentially the same in structure wherever found, and which he thinks it desirable universally to denominate an *ovisac.* This vesicle is the "couch *interne*" of the graafian vesicle, as

[1] See Lond. and Edinb. Phil. Mag. vol. ii. p. 138.

described by Professor Baer. The graafian vesicle of mammalia is nothing more than an ovisac that has acquired a covering or tunic, susceptible of becoming highly vascular, which covering is the "couche *externe*" of the graafian vesicle as described by Baer. The ovisac of birds, amphibia, and fishes ("chorion" of some authors), acquires in like manner a covering or tunic, susceptible of becoming highly vascular; and by the union of the ovisac with this covering, there is constituted a structure analogous to the graafian vesicle of mammalia. The quantity of yelk in the former being large, that portion of the ovary which contains the structure here referred to (as analogous to the graafian vesicle of mammals) becomes pendent; and now the united coverings of the yelk-ball,—viz. the ovisac, its external tunic, the ovarian stroma, and the peritoneal investment,—are together called the *calyx*. From this it will be obvious that the graafian vesicle is not a structure peculiar to mammalia, as it has been supposed.

The ovisac has at first an elliptical or ellipsoidal form, becomes more spherical, and in mammalia is often met with somewhat tapered at one end. The structure of the ovisac in some of the mammalia may be examined when it does not exceed in length the 50th or even the 100th part of a Paris line, that is, in the latter case, the 1125th of an English inch. Myriads of ovisacs with their contents are formed that never reach maturity. Some of the ovisacs which do not reach maturity are situated in the parietes of graafian vesicles in mammalia, or of the corresponding structures in other vertebrata; being sometimes formed in this situation, and sometimes included within the covering which the larger ovisac acquires. The minute ovisacs so situated the author proposes to denominate *parasitic* ovisacs. The ovisac is often found in a cavity proper to itself, with the walls of which it has no organic union. The granules forming the envelope of the germinal vesicle above referred to, and subsequently found in the fluid of the ovisac, are very peculiar in their appearance, contain a nucleus, and sometimes also a pellucid fluid, and are intimately connected with the evolution of the ovum. These granules are present in largest quantity in the ovisac of mammalia; yet granules essentially the same exist in an early stage in the ovisac of birds, and are sometimes met with in that of fishes.

A continual disappearance of ova, and a formation of other, are observable even at a very early age. The ovum of mammalia when completely formed, is at first situated in the *centre* of the ovisac. It is at this period supported in the centre of the ovisac by an equable diffusion of granules throughout the fluid of the latter. The ovisac about the same time begins to acquire a covering or tunic, by which addition, as already stated, there is constituted a graafian vesicle; and of the latter the ovisac is now the inner membrane. After this period, then, it is proper to speak, not of an ovisac, but of a graafian vesicle. The peculiar granules of the graafian vesicle arrange themselves to form three structures, viz. the *membrana granulosa* of authors, and two structures not hitherto described, one of which the author proposes to name the *tunica granulosa*, and the other, which is rather an assemblage of structures than a single structure, the *retinacula*. The tunica granulosa is a spherical covering proper to the ovum, and its presence explains why the outer line in the double contour of the thick chorion has remained so long unobserved. At a certain period this tunic, in some animals at least, is seen to have tail-like appendages, consisting of granules similar to its own. The retinacula consist of a central mass containing the ovum in its tunica granulosa, and of cords or bands extending from this central mass to the membrana granulosa. These structures at a certain period become invested by a membrane. The offices of the retinacula appear to be,—first, to suspend the ovum in the fluid of the graafian vesicle,—next to convey it to a certain part of the periphery of this vesicle,—and subsequently to retain it in the latter situation, and also to promote its expulsion from the ovary. The particular part of the periphery of the

graafian vesicle to which the ovum is conveyed, is uniformly that directed towards the surface of the ovary. The mass of granules escaping with the ovum on the bursting of a graafian vesicle under the compressor, is composed chiefly of the tunica granulosa and the ruptured retinacula. The "cumulus" of Professor Baer is made up of the parts called by Dr. Barry the tunica granulosa and the central portion of the retinacula; and the band-like portions, collectively, of what Dr. Barry calls the retinacula, mainly contribute to produce the appearance denominated the "flat disc" by Professor Baer.

In mammalia a thick and highly transparent membrane—the true chorion—is formed external to the proper membrane of the yelk, while the latter is in the ovary. The inner part of the substance of the chorion in its early stages is in a fluid state, so that the yelk-ball moves freely in it; but it subsequently acquires more consistence. There is not any structure corresponding to the chorion in the *ovary* of other vertebrated animals.

The following appears to be the order of formation, as to time, of the more prominent parts of the ovum and the graafian vesicle in mammalia, viz.:—

1. The germinal vesicle, with its contents, and its envelope of peculiar granules.
2. The proper membrane of the ovisac, which forms around this envelope of granules.
3. The yelk, which forms around the germinal vesicle.
4. The proper membrane of the yelk, which makes its appearance while the yelk is still in an incipient state.
5. The chorion.
6. { The covering or tunic of the ovisac; and about the same time, the peculiar granules of the ovisac arrange themselves to form—
   { The tunica granulosa,
   { The retinacula, and
   { The membrana granulosa.

Such of these structures as are present in the ovary of other vertebrata, appear to originate in the same order as to time.

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*Contributions to the Physiology of Vision.* By Charles Wheatstone, Esq., F. R. S., Professor of Experimental Philosophy in King's College, London. Part the First. "On some remarkable and hitherto unobserved Phænomena of Binocular Vision."—The author first shows that the perspective projections of an object upon the two retinæ differ according to the distance at which the object is placed before the eyes; if it be placed so distant that to view it the optic axes must be parallel, the two projections are precisely similar; but if it be placed so near that to regard it the optic axes must converge, a different perspective projection is presented to each eye; and these perspectives become more dissimilar as the convergence of the optic axes becomes greater. Notwithstanding this dissimilarity between the two pictures, which is in some cases very great, the object is still seen single; contrary to the very prevalent metaphysical opinion, that the single appearance of objects seen by both eyes is owing to their pictures falling on corresponding points of the two retinæ. After establishing these principles, the author proceeds to ascertain what would result from presenting the two monocular perspectives, drawn on plane surfaces, to the two eyes, so that they shall fall on the same parts of the two retinæ as the projections from the object itself would have fallen. Several means are described by which this may be accomplished; but the author especially recommends for this purpose an apparatus called by him a *stereoscope*, which enables the observer to view the resulting appearances without altering the ordinary adaptation of the eyes, and therefore without subjecting these organs to any strain or fatigue. It consists of two plane mirrors with their backs inclined

to each other at an angle of 90°, near the faces of which the two monocular pictures are so placed that their reflected images are seen by the two eyes, one placed before each mirror, in the same place; the apparatus has various adjustments by means of which the magnitude of the images on the retinæ may be varied, and the optic axes differently converged. If the two monocular pictures be thus presented one to each eye, the mind will perceive, from their combined effect, a figure of three dimensions, the exact counterpart of the object from which the pictures were drawn; to show that this curious illusion does not in the least depend on shading or colouring, the illustrations principally employed are simple outline figures, which give for their perceived resultants skeleton forms of three dimensions. Each monocular outline figure is the representation of two dissimilar skeleton forms, one being the form which it is intended to represent, and another, which Prof. Wheatsone calls its converse figure. Viewed by one eye alone the outline may with equal ease be imagined by either; but when the two monocular pictures are viewed one by each eye, the proper or the complemental form may be fixed in the mind; the former, if the right and left pictures be presented respectively to the right and left eyes; and the latter, if the right picture be presented to the left eye, and the left picture to the right eye. Many new experiments are then detailed, and a variety of instances of false perception of visual objects, some new, others formerly observed, are traced to these principles; among others, the well known apparent conversion of cameos into intaglios. The author next proceeds to show that pictures similar in form but differing in magnitude within certain limits, when presented, one to each eye, are perceived by the mind to be single and of intermediate size; and also that when totally dissimilar pictures, which cannot be combined by the mind into the resemblance of any accustomed objects, are presented one to each eye, they are in general not seen together, but alternately. The memoir concludes with a review of the various hypotheses which have been advanced to account for our seeing objects single with two eyes; and the author states his views respecting the influence which these newly developed facts are calculated to have on the decision of this much-debated question.

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*Case of Amaurosis.* By Dr. Alle, of Brünn.[1]—A strong, and previously healthy woman, 30 years old, had taken drastic pills, and induced a severe diarrhœa, to which was superadded a fever of remitting typhous and gastric character. This had continued above a week, when Dr. A. was called in. The diarrhœa diminished under the use of sal ammoniac in small doses; but the patient was suddenly seized, after eating, with perfect amaurosis, without any fever. An emetic restored the power of vision in part, and a repetition of this remedy, followed up for several successive days, by the use of strong valerian tea, completed the cure.

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*Preservation of Bodies by Arsenic.*[2]—Amongst the substances which have been most frequently employed for the purpose of retarding the decomposition of the human body is arsenic, and the following experiments, an account of which is contained in the Calcutta Quarterly Journal, show with what advantage it may be applied, even in a warm climate.

The experiments to which we allude, consist in the injection of an arsenical solution into the blood vessels shortly after death, in the manner presently to be detailed. The method in question was first recommended by Dr. Tranchina, of Palermo, who published an account of it in the Sicilian journal, La Cerere, in 1834.[3]

On the 9th of March, a favourable subject having been selected, a solution,

[1] Med. Zeits. f. Geburtsk. v. Busch u. s. w. Bd. v.
[2] Lancet, Nov. 3, p. 247.
[3] See Intelligencer, vol. ii. p. 65.—*Ed.*

consisting of one pound of white arsenic, boiled in eleven pints of water, was injected into the carotid arteries. The injecting tube was first introduced into the carotid arteries. The injecting tube was first introduced into the vessel of the right side, and pointed upwards so as to send the injection through the head. The pipe was next placed in the left carotid, and a further portion of the solution injected downwards through the arch of the aorta. Sufficient pressure was employed to return the fluid through the superficial veins. The remainder of the solution was then thrown into the abdominal cavity through a very small opening, so as to prevent the access of air. The subject was then allowed to remain undisturbed up to the 19th March, in a room at the temperature of the season, varying from 85° to 90°. On that day the only external change observable was a slight dryness and shriveling of the extremities of the fingers and toes: the eyes were sunken and covered with a white efflorescence, and the cuticle generally could be scraped off with ease. The abdomen was opened, and the muscles were seen to be as red and fresh as though the individual had died but an hour before. The external coat of the intestinal canal was slightly red, but all the other viscera were natural in appearance, and free from the usual abdominal fetor. On cutting into the intestines, the morbid characters of dysentery, the disease of which the patient had died, were beautifully marked. Huge sloughs were hanging from the ulcerated mucous membrane of the colon, and the usual signs of inflammatory action were as distinctly visible upon the coats of that part of the bowels, as they could be in the most recent subject. The thorax presented appearances perfectly fresh and natural. The cranium was then opened, and the brain was observed to be similarly unchanged; indeed, it was so remarkably firm and fresh, that Professor Goodeve took it away with him to serve for his anatomical lecture upon that organ; and having undergone the usual soaking in alum water for a few hours, it could not be surpassed as a subject for demonstration by the most recent brain ever extracted. Perhaps this is the first time that the brain removed from a corpse nearly a fortnight after death, could ever be made available for the purposes of the anatomical lecturer. We all remember how hopeless, even in Europe, under the most favourable circumstances, is the task of unraveling the mysteries of the cerebral labyrinth in a brain which has been allowed to remain in the body more than a few hours after death; how much less, then, could this have been expected in a tropical climate, with a thermometer at 90° for a great part of the day.

The abdomen and scalp of the body under experiment was then sewed up with care, and some more of the arsenical injection was introduced into the cavities which had been exposed. The body was again *left to repose*, and up to the present day, (the 1st of April), upwards of three weeks after death, but little further alteration has taken place in its external appearance, except an increased shriveling and some slight signs of putrefaction in the dorsal region.

The success of the first experiment emboldened the professors of the medical college, Calcutta, after a few days, to inject other bodies. As yet, it was not known whether dissection would interfere with the antiseptic properties of the arsenic, for the inventor spoke of the injection only as a means of preserving the bodies entire; but we rejoice to say, that the arsenic loses none of its preservative characters, although the whole body be subjected to the operation of the anatomist.

Several subjects have now been injected with the preparation in question, and all have been preserved in a degree which has astonished those who have had an opportunity of observing them. Many of these bodies remained under examination for seven and eight days,—until, indeed, they were completely dissected—before any putrefaction commenced. Of these some were permitted to continue untouched for a day or two before they were dissected, with a view to permit the arsenic to penetrate all the tissues of the body, and become thoroughly infiltrated into every part. Others were

given up to the knife the instant the injection had been completed;—both cases were attended with similar results; though, perhaps, the former is, upon the whole, the preferable method where minute dissections, requiring a length of time for their completion, are intended. With a view to test the value of the arsenic, several bodies, which have not been *arsenicated*, were placed in the same room with those injected, but the heat of the climate had such an effect upon them, that they putrefied rapidly, and were perfectly intolerable and useless in eight and forty hours. In one subject an injection of alum, nitre, and common salt, was introduced into the upper extremity; but this preparation, although strongly recommended, was utterly inefficient: indeed, it seemed rather to hasten putrefaction than retard it.

It will be observed, that, in the first experiment, the injection was made through the carotids: this was in obedience to the directions of the inventor, because, he says, that it is important to prevent the air from entering the cavities of the body, which would occur if the thorax were divided and the injection driven from the aorta. But in all the subsequent cases in the Medical College, the injections were introduced in the ordinary mode, by lifting up the sternum and inserting the pipe into the left auricle of the heart. This, which is far less troublesome than the former method, is found to be equally efficacious for all ordinary purposes, although, perhaps, it may be advisable to follow Dr. Tranchina's directions, where it is an object to preserve the body untouched for any great length of time. It is right to state, also, that some pieces of flesh have been preserved in the solution for several days together without putrefying—in fact, substances actually in a state of decomposition were restored to a certain degree of sweetness, and the fetid odour which exhaled from them speedily destroyed by remaining a few minutes in the arsenical liquor.

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*Paralysis of the Facial Nerve.* By Dr. Ulrich, of Coblenz.[1]—Dr. U. witnessed a palsy of all the muscles of the left half of the face, which are supplied by the facial nerve, in a lady of rank, who had traveled from Italy into Germany in hot weather, and before the palsy had suffered several weeks from dull headach. The muscles of mastication performed their functions without disturbance, but the peculiar muscles of the face remained quite still during the act of speaking, and the mouth was drawn toward the right side. The left eye could not be closed, and the patient endeavoured to remedy this evil in a measure, by turning the ball strongly upward and thus protecting the pupil under the open eyelid. Sensation remained undisturbed. The patient suffered from periodic pain and sense of heat in the left side. She was well in other respects and her mind unimpaired; spoke with some, but not much difficulty, and at times placed her hand upon her left cheek, so as to give the mouth its right direction. It appeared most probable, from the previous headach, that the lesion of the nerve existed within the skull, and this rendered the prognosis less favourable. The actual result of the case was unknown to Dr. U., but he heard of the patient's death about a year afterward.

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*Case of Epilepsy continuing Nine Years, and at length removed by an accidental Injury.* By Salvator de Renzi, communicated by Dr. Busse, of Berlin.[2]—A young man of 18, who had suffered from epilepsy since his eighth year, was now subject to weekly attacks, and had tried various remedies without benefit. In consequence of an explosion of gunpowder, he fell from an upper into a lower story, and suffered a fracture of the os frontis and of the left thigh. These injuries confined him to the bed for five months; the wound of the head suppurated and the bone exfoliated. During this time

[1] Caspar's Wochensch. f. d. gesam. Heilk. 1838, Nr. 9.
[2] Hufeland's J. d. prac. Heilk. Jan. 1838.

he had no return of the paroxysm; his countenance also became intelligent, and his mental powers returned. Hardly had the wound of the head closed, when the epileptic attacks returned with renewed violence. Dr. R. then placed a seton in the patient's neck, and from that time the epilepsy disappeared.

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*Emetic Injection into the Median Vein.* By Surgeon Balbach, of Wollin.—Dr. B. was applied to at an early hour by a patient, who on the previous day, at dinner, had attempted to swallow a large piece of meat, which refused to pass into the stomach. Nothing could be discovered by external examination. The man was directed to take some water, and make a strong effort to swallow, but this expedient proved fruitless. An attempt was then made to push the foreign body into the stomach with a probang; but this was found to be impossible. Dr. B. then proceeded to operate by pinching up and dividing a fold of skin over the median vein, laying bare the vessel, passing a probe under it, and making an incision of sufficient size to admit the orifice of a syringe. The arm was held in a perpendicular position by an assistant, and a quantity of a solution of tartar emetic, three grains to the ounce, was thrown into the vein. In less than a minute the patient complained of nausea. A second injection brought on vomiting in two minutes, and a piece of meat was rejected, two inches long, one and a half broad, and one thick.

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*University of the City of New York.*—It is affirmed, in the last New York Weekly Whig, that all the medical professors of this nascent institution, dissatisfied with the acts of the council, have resigned their situations.

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## BOOKS RECEIVED.

*From the Publishers.*—A Treatise on the Diseases produced by Onanism, Menstruation, Self-Pollution, and other Excesses. By L. Deslandes, M. D., Member of the Royal Academy of Medicine at Paris, and other learned societies. Translated from the French, with many additions. 12mo, pp. 252. Boston, 1838.

[We doubt exceedingly the utility of publishing works like the present. Our own professional observation would lead us to infer, that the results of the practices mentioned, injurious in many respects, as they doubtless are, have been greatly exaggerated; and on the same grounds we cannot help suspecting unintentional ultraism in the statement in the preface, copied from the last annual report of the State Lunatic Asylum of Massachusetts, "that of the number of insane received at that institution during the last year, no less than *thirty-two* lost their senses from this cause."

The mischief is great; but may not works like the present suggest the practices to minds previously unacquainted with them, rather than deter those who are already guilty.]

The Student's Compendium of Comparative Anatomy, By P. Evers, Licentiate of the Royal College of Physicians in Ireland. 8vo, pp. 168. London, 1839.

*From the Author.*—Anatomical Cabinet, belonging to R. D. Mussey, M. D., Professor of Surgery in the Medical College of Ohio. Printed for the use of the pupils. 8vo, pp. 20.

[1] Med. Zeit. v. Vereine f. Heilk. in Preus. 1837, Nr. 49.